

CLAIMS

Sub C1

1. A semiconductor device package, comprising:
 a semiconductor die having a first surface on which an integrated circuit and at least one electrically conductive bond pad are fabricated;
 at least one electrically conductive external terminal;
 an interposer having a die attach surface and an external surface opposite of the die attach surface disposed in between the semiconductor die and the at least one external terminal, the interposer having at least one electrically conductive interconnect electrically coupling the at least one bond pad of the semiconductor die positioned adjacent to the die attach surface to the at least external terminal positioned adjacent to the external surface; and

a plurality of pieces of adhesive film disposed in between the semiconductor die and the interposer to adhere the semiconductor die to the die attach surface of the interposer.

Sub I 2

2. The package of claim 1, further comprising an encapsulating material substantially filling regions remaining in between the semiconductor die and the interposer.

3. The package of claim 1 wherein the interposer comprises a flexible material.

4. The package of claim 1 wherein the plurality of pieces of adhesive material comprises a compliant material.

Sub C2

5. The package of claim 1 wherein each of the plurality of pieces of adhesive film comprises:

a first adhesive layer adhered to the die attach surface of the interposer;
 a second adhesive layer adhered to the semiconductor die; and

sub I3 >
conductive

5600 "a"
Sub C³
ad
of

7. The package of claim 1 wherein the first surface of the semiconductor die is adhered to the die attach surface of the interposer by the plurality of pieces of adhesive film.

8. The package of claim 1 wherein the at least one electrically conductive external terminal comprises a solder ball.

9. The package of claim 1 wherein the plurality of pieces of adhesive film comprise strips of adhesive film positioned in parallel along a longitude of the semiconductor die.

10. The package of claim 1 wherein a first and a second of the plurality of pieces of adhesive film are positioned at a right angle with respect to each other.

11. A device package assembly for a semiconductor die being constructed from a process comprising:

laminating a plurality of pieces of adhesive film to an interposer having at least one electrically conductive interconnect, the interposer further having a die attach surface to which the semiconductor die is attached, and an external surface opposite of the die attach surface;

attaching to the interposer the semiconductor die having a first surface on which an integrated circuit and at least one electrically conductive bond pad are fabricated; and

bonding the at least one electrically conductive interconnect to the at least one electrically conductive bond pad.

sub I 5 > 12. The package assembly of claim 11 wherein the process further comprises substantially filling regions remaining in between the semiconductor die and the interposer with an encapsulating material.

13. The package assembly of claim 11 wherein the process further comprises attaching an external terminal to the at least one electrically conductive interconnect adjacent to the external surface of the interposer.

14. The package assembly of claim 13 wherein the external terminal comprises a solder ball.

15. The package assembly of claim 11 wherein the interposer comprises a flexible material.

16. The package assembly of claim 11 wherein each of the plurality of pieces of adhesive film comprises a compliant material.

Sub CH 17. The package assembly of claim 11 wherein each of the plurality of pieces of adhesive film comprises a single layer of elastomer material.

18. The package assembly of claim 11 wherein the plurality of pieces of adhesive film comprise strips of film positioned in parallel along a longitude of the semiconductor die.

19. A method for reducing thermal mismatch stress in a semiconductor device package for a semiconductor die having an integrated circuit and at least one electrically conductive bond pad, the method comprising adhering the

09265366-073099

semiconductor die to a die attach surface of an interposer by using a plurality of pieces of adhesive film disposed therebetween, the interposer having at least one conductive interconnect electrically coupled to the bond pad, and further having an external surface opposite of the die attach surface and to which an external terminal electrically coupled to the conductive interconnect is adjacent.

20. The method of claim 19, further comprising substantially filling regions remaining in between the semiconductor die and the interposer with an encapsulating material and covering the at least one conductive interconnect.

21. The method of claim 19 wherein the interposer comprises a flexible material.

22. The method of claim 19 wherein each of the plurality of pieces of adhesive film comprises a compliant material.

23. The method of claim 19 wherein each of the plurality of pieces of adhesive film comprises:

a first adhesive layer adhered to the die attach surface of the interposer;
a second adhesive layer adhered to the semiconductor die; and
at least one carrier layer disposed in between the first and second adhesive layers.

24. The method of claim 19 wherein each of the plurality of pieces of adhesive film comprises a single layer of elastomer.

25. The method of claim 19 wherein the external terminal comprises a solder ball.

0936356-073099

26. A method for packaging a semiconductor device, comprising:
laminating a plurality of pieces of compliant adhesive film to an interposer having at least one electrically conductive interconnect, the interposer further having a die attach surface to which a semiconductor die is attached, and an external surface opposite of the die attach surface,

attaching to the interposer the semiconductor die having a first surface on which an integrated circuit and at least one electrically conductive bond pad are fabricated; and

bonding the at least one electrically conductive interconnect to the at least one electrically conductive bond pad.

27. The method of claim 26, further comprising substantially filling regions remaining in between the semiconductor die and the interposer with an encapsulating material and covering the at least one conductive interconnect.

28. The method of claim 26 wherein the interposer comprises a flexible material.

29. The method of claim 26 wherein each of the plurality of pieces of compliant adhesive film comprises:

a first adhesive layer adhered to the die attach surface of the interposer;

a second adhesive layer adhered to the semiconductor die; and

at least one carrier layer disposed in between the first and second adhesive layers.

30. The method of claim 26 wherein each of the plurality of pieces of compliant adhesive film comprises a single layer of elastomer.

09365556-073099

31. The method of claim 26, further comprising attaching a solder ball to the at least one electrically conductive interconnect adjacent to the external surface of the interposer.

32. A method for packaging a semiconductor device, comprising:
laminating a plurality of pieces of compliant adhesive film to a semiconductor die having a first surface on which an integrated circuit and at least one electrically conductive bond pad are fabricated;

attaching to the semiconductor die an interposer having at least one electrically conductive interconnect, the interposer further having a die attach surface to which a semiconductor die is attached, and an external surface opposite of the die attach surface; and

bonding the at least one electrically conductive interconnect to the at least one electrically conductive bond pad.

33. The method of claim 32, further comprising substantially filling regions remaining in between the semiconductor die and the interposer with an encapsulating material and covering the at least one conductive interconnect.

34. The method of claim 32 wherein the interposer comprises a flexible material.

35. The method of claim 32 wherein each of the plurality of pieces of compliant adhesive film comprises:

a first adhesive layer adhered to the die attach surface of the interposer;
a second adhesive layer adhered to the semiconductor die; and
at least one carrier layer disposed in between the first and second adhesive layers.

09365356-073099

36. The method of claim 32 wherein each of the plurality of pieces of compliant adhesive film comprises a single layer of elastomer.

37. The method of claim 32, further comprising attaching a solder ball to the at least one electrically conductive interconnect adjacent to the external surface of the interposer.

Add F5